

## REMARKS

Reconsideration of the application is respectfully requested for the following reasons:

1. Confirmation of Election

Although elected claims 1, 2, 4, 5, 14, 20, and 21 have been canceled, the subject matter of new claims 22-36 is restricted to subject matter included in the original elected claims.

2. Objections to Specification and Claims, and Rejection Under 35 USC §112, 2<sup>nd</sup> Par.

The claims, specification, and abstract have been revised to place the application in proper U.S. format and to correct numerous grammatical and idiomatic errors. Because the changes are all formal in nature, it is respectfully submitted that the changes do not involve new matter.

3. Rejection of Claims 1, 2, 4, 5, 14, 20, and 21 Under 35 USC §102(b) in view of U.S. Patent No. 4,127,835 (Knutson)

This rejection is respectfully traversed on the grounds that the Knutson patent fails to disclose or suggest the following features of the claimed invention:

- **axial displacement** of a rotor relative to a **rotary shaft** (the “armature” of Knutson is not displaceable relative to 116, and the shaft 116 does not rotate); and/or
- a **helical structure** between the rotor and the shaft (the armature of Knutson is fixed to the shaft, which is actually the “pushrod” of a linear actuator, and not a rotary shaft).

The purpose of the claimed invention is to provide an electromagnetic device (whether a motor or a generator) in which as the shaft rotates, the rotor coupled to the shaft moves axially. In the elected embodiment, the rotor is coupled to the shaft by a helical structure (also known as a “screw” or “worm”). When a reverse torque occurs because of the drag provided by the load

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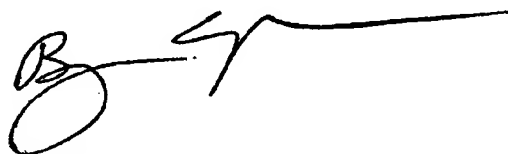
in opposition to the torque provided by interaction between the magnetic field structure and rotor (or conversely, because of the drag provided by the field structure in generator mode, which opposes an external driving force), the rotor will move axially along the shaft. This axial movement can either be used to operate a clutch or other control or testing device or, by altering the magnetic, electrical, or physical properties of the field structure or rotor in an axial direction, can be used to alter the operational characteristics of the motor or generator depending on the amount of reverse torque (with further adjustment possible through the use of an external device for controlling the amount of displacement of the rotor along the shaft).

The Knutson patent, on the other hand, merely teaches a linear actuator with springs on either end of the armature. The shaft is not a "rotary" shaft, as claimed, movement of the armature does not involve "reverse torque," and no helical structure is involved (or necessary). As a result, the Knutson patent fails to teach any of the features of the claimed invention, and withdrawal of the rejection of the elected claims under 35 USC §102(b) is respectfully requested.

Having thus overcome each of the rejections made in the Official Action, withdrawal of the rejections and expedited passage of the application to issue is requested.

Respectfully submitted,

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TITLE: ROTOR AXIAL ACTIVATION MODULATION OF ELECTRIC MACHINERY  
DUE TO REVERSE TORQUE

BACKGROUND OF THE INVENTION

5 (a) Field of the Invention

This ~~rotor axial activation modulation of electric~~  
~~machinery due to reverse torque is to reveal, invention relates~~  
~~to electrical machinery having at least one rotor that is axially~~  
~~displaceable relative to a magnetic field structure, as a result~~  
10 ~~of reverse torque. The axial displacement may be achieved~~  
~~through the use of a between the electric machinery transmission~~  
~~rotating shaft and the electric machinery rotor, or between~~  
~~the electric machinery transmission rotating shaft and the~~  
~~transmission element driven, there is installed a reversible~~  
15 ~~activation-helical mechanism and axial pre-stressed spring~~  
~~consist of a helical nut (and corresponding groove in the shaft)~~  
~~or helical nut with ball bearing or roller bearing structure~~  
~~that, during the operation of the electric machinery, depending~~  
~~on the magnitude of the torque between the electric machinery~~  
20 ~~rotor and the loading load, to produce produces axial~~  
~~displacement with of the electric machinery rotor, and further~~  
~~to modulate its electric machinery characteristics with respect~~  
~~thereby either changes the coupling relationship between the~~  
~~rotor and to the electric machinery magnetic field, or to pull~~  
25 ~~pulls an axial control clutch CLS100, or to pull other pulls~~  
~~another selected control structure or testing device.~~

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(b) Description of the Prior Art

Among the rotating electric machinery products ~~sold in the~~  
~~market currently being marketed~~ there are electric machinery  
structures combining ~~the taper a tapered~~ rotor and ~~taper hole~~  
5 tapered recess electric machinery magnetic field. When  
activated the axial electro-magnetic attraction force will  
drive the axial, normally closed activation mechanism. Its  
function is to act as the axial driving power source to control  
the normally closed activation mechanism. However, its  
10 electric machinery ~~characteristic remains singular~~  
characteristics cannot easily be varied.

SUMMARY OF THE INVENTION

~~This~~ The invention ~~is about~~ involves installation of a  
15 helical nut structure, or a helical nut and ball or roller bearing  
structure, between the an electric machinery transmission shaft  
~~or electric machinery transmission shaft and the a driven~~  
transmission element ~~driven, there is installed a helical nut~~  
~~structure or helical nut structure with ball bearing or roller~~  
20 ~~bearing structure, and depending.~~ Depending on the torque  
between the electric machinery rotor, and on the loading and  
~~the or~~ driving direction, the corresponding axial displacement  
of the electric machinery rotor can be controlled, and further  
the electric machinery characteristics ~~between~~ relative to the  
25 electric machinery rotor and the electro-magnetic field can

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be modulated ~~or to pull selected~~ to achieve a desired control  
structure or testing device.

BRIEF DESCRIPTION OF THE DRAWINGS

5        Fig. 1 is ~~the a~~ a cross sectional illustration view of the  
main structure of this invention.

Fig. 2 is ~~the a~~ a cross sectional illustration across view  
taken along line A-A' in Fig. 1.

10        Fig. 3 ~~shows the is~~ a cross sectional illustration of this  
an embodiment of the invention where in which a reverse  
activation helical structure is installed between the  
transmission shaft of the electric machinery and the ~~loading~~  
~~there is installed the reverse activation helical structure~~  
load.

15        Fig. 4 ~~shows the is~~ a cross sectional illustration of this  
an embodiment of the invention where in which a spring structure  
is installed between a dual electric machinery rotor formed  
in one body with the transmission shaft and ~~between the dual~~  
electric machinery rotors ~~there is installed a spring structure.~~

20        Fig. 5 ~~shows the is~~ a cross sectional illustration of this  
an embodiment of the invention where the in which dual electric  
machinery ~~rotor~~ rotors are installed with two separate  
transmission shaft ~~structure~~ structures.

25        Fig. 6 is ~~the a~~ a cross sectional illustration similar to  
that of Fig. 5 where in which a controllable clutch is installed

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between each individual transmission shaft ~~there is installed~~  
~~controllable clutch.~~

Fig. 7 is ~~the~~ a cross sectional illustration of ~~realization~~  
~~of this~~ an embodiment of the invention where in which a  
5 pre-stressed spring is installed ~~in~~ between the two electric  
machinery rotors.

Fig. 8 is ~~the~~ a cross sectional illustration of ~~realization~~  
~~of this~~ an embodiment of the invention where in which the  
pre-stressed springs are installed on ~~the~~ outer sides of the  
10 two electric machinery rotors.

Fig. 9 is ~~the~~ a cross sectional illustration of ~~realization~~  
~~of this~~ an embodiment of the invention where in which  
pre-stressed springs are installed between the electric  
machinery rotors and on the outer sides.

15 Fig. 10 is ~~the~~ a cross sectional illustration of ~~realization~~  
~~of this~~ the invention where in which the two electric machinery  
rotors have individual transmission shafts and ~~there are~~  
~~installed~~ pre-stressed springs are installed between the  
electric machinery rotors.

20 Fig. 11 is ~~the~~ a cross sectional illustration of ~~realization~~  
~~of this~~ an embodiment of the invention where in which the two  
electric machinery rotors have individual transmission shafts  
and ~~there are installed~~ pre-stressed springs are installed  
between the electric machinery rotors and the stator.

25 Fig. 12 is ~~the~~ a cross sectional illustration of ~~realization~~  
~~of this~~ an embodiment of the invention where in which the two

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electric machinery rotors have individual transmission shafts and ~~there are installed~~ pre-stressed springs are installed between the electric machinery rotors and between the individual electric machinery rotors and the stator.

5        Fig. 13 is ~~the~~ a cross sectional illustration of realization of ~~this~~ an embodiment of the invention where ~~in which~~ controllable clutches are installed between the transmission shafts of the two electric machinery rotors ~~there are installed~~ controllable clutches and a pre-stressed spring is installed  
10    between the two electric machinery rotors ~~there are installed~~ pre-stressed spring.

      Fig. 14 is ~~the~~ a cross sectional illustration of realization of ~~this~~ an embodiment of the invention where ~~in which~~ controllable clutches are installed between the transmission  
15    shafts of the two electric machinery rotors ~~there are installed~~ controllable clutches and a pre-stressed spring is installed between the two electric machinery rotors and the stator on the outside ~~there are installed~~ pre-stressed spring axially  
      outside facing sides of the rotors.

20        Fig. 15 is ~~the~~ a cross sectional illustration of realization of ~~this~~ an embodiment of the invention where ~~in which~~ controllable clutches are installed between the transmission shafts of the two electric machinery rotors ~~there are installed~~ controllable clutches and pre-stressed springs are installed  
25    between the two electric machinery rotors and between the individual electric machinery rotors and the stator on ~~the~~

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~~outside there are installed pre-stressed springs axially~~  
outside facing sides of the rotors.

Fig. 16 is ~~the~~ a cross sectional illustration of ~~this~~ a  
preferred embodiment of the invention which is that forms an  
5 axial multiple circuit squirrel cage rotor structure.

Fig. 17 is ~~the~~ a cross sectional illustration of ~~the~~  
~~realization of this~~ a preferred embodiment of the invention  
with including an axial extension brush armature.

Fig. 18 is ~~the~~ a cross sectional illustration of ~~the~~  
10 ~~realization of this~~ a preferred embodiment of the invention  
~~by using the~~ that employs a reverse torque to produce axial  
activation in order to pull an axial control clutch.

Fig. 19 is ~~the~~ a cross sectional illustration of ~~the~~  
~~realization of this~~ a preferred embodiment of the invention  
15 ~~which is the~~ applied to an electric machinery magnetic field  
or electric machinery rotor for axial modulation settings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

~~This electric~~ Electric machinery modulated by a rotor  
20 axially activated ~~rotor due to by~~ reverse torque ~~is to reveal~~  
includes, according to the principles of the invention, a  
reverse activation helical structure situated between the  
electric machinery transmission shaft and the electric  
machinery rotor, or between the electric machinery transmission  
25 shaft and ~~the~~ a transmission element being driven, ~~there is~~  
~~installed a~~ The reverse activation helical structure ~~consist~~

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~~of includes a helical propeller structure or a helical propeller~~  
~~structure with having a ball bearing or roller bearing structure~~  
~~that, which~~ during the operation of the electric machinery,  
~~through as a result of the reverse torque between the electric~~  
5 ~~machinery rotor and the loading load, to drive drives the~~  
~~electric machinery rotor to produce axial displacement, and~~  
~~further to modulate the electric machinery characteristics~~  
~~between the electric machinery rotor and the electric machinery~~  
~~magnetic field, or to pull an axial controlling clutch CLS100,~~  
10 ~~or to pull other another selected control structure or testing~~  
~~device.~~

~~As shown in Fig. Figs. 1 shows the cross sectional~~  
~~illustration of the main structure of this invention. Fig. and~~  
~~2 is the cross sectional illustration of Fig. 1 along A-A',~~  
15 ~~the major constituents of the invention include:~~  
~~-- Electric machinery magnetic field pole structure F100+~~  
~~including the including constituents of DC or AC generators~~  
~~or motors generator or motor structures, These structures~~  
~~include and magnetic field structures having one of the~~  
20 ~~following configurations:~~

~~F1: Between The magnetic field or pole structure may be arranged~~  
~~such that the magnetic field between the poles of the~~  
~~electric machinery magnetic field pole structure and the~~  
~~electric machinery rotor of which the electric machinery~~  
25 ~~magnetic field exhibits a normal stable even distribution;~~  
~~or~~

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- F2: ~~Between~~ The field structure may be arranged such that magnetic fields between the axial single side or double sides of the poles of the electric machinery magnetic field field structure and the electric machinery rotor of which  
5 ~~the axial single side or double sides exhibit different electric machinery magnetic field intensity intensities so that the magnetic coupling between the field structure and the rotor varies with axial displacement of the rotor;~~  
or
- 10 F3: ~~Between~~ The magnetic fields between the axial single side or double sides of the poles of the electric machinery magnetic field pole structure and the electric machinery rotor of which the axial single side or double sides exhibit may be the result of different gap structures with relative  
15 to the electric machinery rotor to also vary the magnetic coupling with axial displacement; or
- F4: ~~Between~~ The the poles of the electric machinery magnetic field and the electric machinery rotor whose axial single side or double sides of the pole structure consist may  
20 consist of multiple permanent magnetic poles or magnetic poles excited by magnetic windings W100, or combinations of both which consist of axial serial structures to also vary the magnetic coupling with axial displacement; or
- F5: The pole structures may be formed by two or more of the  
25 structures described in F1 through F4 to vary the magnetic coupling with axial displacement;

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~~—The electric~~ Electric machinery rotor R100 ~~including~~  
includes single or mixed electric machinery rotors ~~consist of~~  
of the type used in various commonly used AC or DC generators  
or motors, such as permanent magnet, salient, hysteresis, wound,  
5 brush, turbo, squirrel-cage type AC or DC or brush or brushless,  
synchronous or asynchronous generators or motors, ~~whereas its~~  
wherein the reverse torque structure for the rotor axial  
activation modulation includes:

- (1) ~~Between the electric machinery rotor R100 and transmission~~  
10 ~~shaft S100 there is installed the~~ A reverse activation  
helical structure SC100 installed between the rotor R100  
and a transmission shaft S100, including a ~~consists of~~  
helical propeller structure or helical propeller structure  
with a ball bearing or roller bearing structure, and a  
15 rotary bearing B100 and thrust bearing PB100 situated  
between the electric machinery rotor R100 and a single  
side or dual sides of the stator H100 ~~there is installed~~  
~~the rotary bearing B100 and thrust bearing PB100.~~ The  
reverse activation helical structure SC100 further  
20 includes ~~and there is installed a free~~ freely movable  
rotating axial pre-stressed spring SP100, arranged such  
that when the electric machinery rotor R100 and the  
transmission shaft S100 is operating as a generator or  
motor, ~~through the torque between the electric machinery~~  
25 rotor R100 and transmission shaft S100 ~~acting~~ acts on the  
reversible activation helical structure SC100 ~~in between~~

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and ~~producing~~ produces axial displacement along preset direction, so as to ~~produce~~ modulate the electric field between the electric machinery rotor R100 and the electric machinery magnetic field F100, ~~the preset modulation of~~  
5 ~~the generator or motor feature or pulling axial~~ axially pull on controlling clutch CLS100, or ~~pulling pull~~ other selected control structures or testing devices; or  
(2) ~~This rotor~~ The axial activation modulation of electric machinery due to reverse torque can ~~be as shown in best~~  
10 ~~be understood from Figs. Fig. 2 and 3~~ where, between the transmission shaft S100 of the electric machinery and the transmission structure T100 on the loading side, there is installed a reversible activation helical structure SC200 ~~consist~~ made up of a helical propeller structure  
15 or helical propeller structure with a ball bearing or a roller bearing structure, and where between the transmission shaft S100 of the electric machinery and the stator H100, there is installed a bearing SB100 for ~~the~~ rotary driving and axial displacement, and ~~there is~~  
20 ~~installed a bearing SB100 for the transmission shaft S100~~ to perform rotary driving and axial displacement, and where between the electric machinery rotor and single side or dual sides of the stator H100 there is installed a ~~free~~ freely movable rotating axial pre-stressed spring SP100  
25 structure. A, ~~whereas the~~ transmission structure T100 is provided on the output loading side, and connected through

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the axial pulling resistance and rotating bearing B500 structure to ~~connect to the~~ stator H100, such that when the electric machinery rotor R100 and the transmission shaft S100 is operating as a generator or motor, its reverse torque has the effect of producing axial displacement in a preset direction through the action of the reversible activation helical structure SC200 between transmission rotating shaft S100 and the transmission shaft on the loading side, ~~and produce the axial displacement in the preset direction, so as to generate the modulation of modulate the setting of generator or electric machinery output or exert a features or pulling force in selected control structure or testing devices.~~, as shown in Fig. 3 ~~is the cross sectional illustration of this invention where between the transmission rotating shaft and the transmission structure on the loading side there is installed a reversible activation helical structure, of which the cross sectional illustration along A A' is the same as Fig. 2; or~~

20 (3) ~~Described~~ As described in (1) above, ~~where between the electric machinery rotor R100 and transmission rotating shaft S100~~ the may be installed with a reversible activation helical structure SC100 ~~consists of that includes a helical propeller structure or helical propeller structure with~~ a ball bearing or roller bearing structure, and further ~~include~~ includes using a human, ex-mechanical, ex-fluid,

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or ~~electrical~~ electrically driven ~~relevant~~ device to  
produce ~~cause~~ axial driving ~~to of~~ the transmission shaft,  
modulate and ~~setting~~ set the relative positions of the  
electric machinery rotor R100 and ~~electric machinery~~  
5 ~~magnetic field~~ magnetic field or pole structure F100 to  
actively control the electric machinery characteristics  
or to pull selected a control mechanism or testing devices,  
~~in~~ In addition, depending on the need, ~~to install~~ a  
relative displacement limitation or position locking  
10 device may be installed between electric machinery rotor  
R100 and transmission rotating shaft S100 ~~or position~~  
~~locking device~~; or

- (4) ~~Described~~ As described in (1) ~~previously above~~, installed  
between the electric machinery rotor R100 and transmission  
15 shaft S100 ~~the installed is a~~ reversible activation helical  
structure SC100 ~~consists of that includes a~~ helical  
propeller structure or helical propeller structure with  
a ball bearing or roller bearing structure. In addition,  
between the axial pre-stressed spring SP100 structure  
20 installed on its single side or both sides and stator H100,  
can be further installed ~~relevant~~ a structural device  
driven by human, or mechanical, or fluid, or electrical  
power, so as to produce a pre-stressed control and axial  
displacement setting ~~to for~~ the pre-stressed spring SP100,  
25 in order to actively control and ~~setting~~ set pre-stressed  
spring SP100 for axial pre-stress of the electric machinery

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rotor R100, ~~and to control and setting~~ set the relative relationship of the electric machinery rotor R100 and electric machinery magnetic ~~field~~ pole structure F100, and further to control the electric machinery characteristics or to a pull selected control mechanism or testing devices; or

(5) As Described in (2) above, ~~previously between before installing the transmission shaft S100 and the transmission structure on the loading side T100,~~ there is installed the reversible activation helical structure SC200 ~~consist~~ of helical propeller structure or helical propeller with a ball bearing or roller bearing structure, ~~between the transmission shaft of the electric machinery rotor R100 and the stator H100,~~ there is installed a bearing SB100 for the transmission shaft S100 to perform rotating driving and axial displacement, and between the electric machinery R100 and single side of double sides of the stator H100 there is installed a free movable rotating axial pre-stressed spring SP100 structure. ~~and further Also included include is a device using a human, or mechanical, or fluid, or electrical driven drive relevant device to produce reversal driving to the transmission shaft S100, further to control and set the relative position of the electric machinery rotor R100 and electric machinery magnetic field~~ pole structure F100, to actively control electric machinery characteristics or pull a selected

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control structure or testing device, ~~in~~. In addition,  
depending on the need between the electric machinery rotor  
R100 and transmission shaft S100, there can be installed  
relative position limiting device or position locking  
5 device; or

- (6) ~~Described~~ As described in (2) previously above, between  
the transmission shaft S100 and the transmission structure  
on the loading side T100, there is installed a reversible  
activation helical structure SC200 ~~consist of including~~  
10 a helical propeller structure or the helical propeller  
structure with ball bearing or roller bearing, and between  
the transmission shaft S100 of the electric machinery rotor  
R100 and the stator H100 there is installed the bearing  
SB100 for the transmission shaft for rotating driving and  
15 axial displacement, ~~and~~ Furthermore, between the electric  
machinery rotor R100 and single side or double sides of  
the stator H100 there is installed a ~~free~~ freely movable  
mutating axial pre-stress spring SP100 structure, ~~and~~  
~~further to install which include using uses~~ human, ~~or~~  
20 mechanical, or fluid, or electrical driven relevant device,  
so as to perform pre-stressed control and axial  
displacement setting to the pre-stressed spring SP100,  
and actively control and set the axial pre-stress of the  
pre-stressed spring SP100 with respective to the electric  
25 machinery rotor R100, and to control and set the positional  
relationship between the electric machinery rotor R100

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and electric machinery magnetic field F100, and further to control electric machinery characteristics or to pull selected control structure or testing device.

According to a modification of the above-described  
5 embodiments ~~This rotor axial activation modulation of electric~~  
~~machinery due to reverse torque, further can be the helical~~  
propeller structure can further consist of ~~the a~~ transmission  
shaft S300 with two sections of supporting a clockwise (CW)  
and counter clockwise helical propeller, or ~~the reversible~~  
10 activation helical structure SC100' consist of including a  
helical propeller with ball bearing or roller bearing, to couple  
with the two individual electric machinery rotors R100, ~~between.~~  
Between the two electric machinery rotors may be installed with  
a pre-stressed spring SP100, ~~the~~ The previously described  
15 transmission shaft S300 of the dual electric machinery rotors  
include the one body transmission shaft structure, Fig. 4 shows  
a the cross sectional illustration of this invention where  
dual electric machinery rotors are fixed ~~with to a~~ one body  
transmission rotating shaft while between the two rotors there  
20 is installed a pre-stressed spring structure, ~~the~~ The cross  
sectional illustration along A-A' is the same as Fig. 2; or  
may consist of two sections of individual transmission shaft  
S300', as shown in Fig. 5, which is the a cross sectional  
illustration of this invention ~~where showing~~ two electric  
25 machinery rotors with two sections of individual transmission  
rotating shaft structure, of which the cross sectional

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illustration along A-A' is the same as Fig. 2; or further between  
the two individual transmission shaft S300' there can be  
installed the clutch CL100 using human, or mechanical, or fluid,  
or electrical power so as to combine the two electric machinery  
5 rotors for connection operation or for individual separate  
operation, as shown in Fig. 6. Fig. 6 is the a cross sectional  
illustration of the realization example of embodiment  
illustrated in Fig. 4, where between the two individual  
transmission shafts there is installed a controllable clutch,  
10 its cross sectional illustration along A-A' is being the same  
as in Fig. 2, the. The previously described two individual  
electric machinery rotors R100 are coupled to their individual  
electric machinery magnetic field pole structures F100  
structures, and between the two electric machinery rotors there  
15 is installed pre-stressed spring SP100, and the two individual  
electric machinery rotors R100 can be optionally being electric  
machinery rotors with the same characteristics or different  
characteristics, the two electric machinery magnetic fields  
pole structures F100 being coupled by the two electric machinery  
20 rotors also can be generating electric machinery magnetic fields  
of same or different characteristics. , this refer The modulation  
elements, in the form of axial pre-stressed springs, axial  
activation modulation of electric machinery due to reverse  
torque its constituents include may be installed in any of the  
25 following arrangements:

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- (1) Axial pre-stressed spring SP100 may be installed between  
two electric machinery rotors R100, with one of them ~~the~~  
generating a reverse torque in the direction of rotation  
increases, and the two individual electric machinery rotors  
5 ~~R100 exhibit~~ exhibiting mutually complementary axial  
~~mutual compelling modulation displacement, as shown in~~  
Fig. 7 (it will be appreciated that the cross-sections  
along lines A-A' in each of 7-19 will be the same as shown  
in Fig. 2, ~~as show in Fig. 7 is the cross sectional~~  
10 ~~illustration of the realization of this invention where~~  
~~the pre stressed spring is installed between the two~~  
~~electric machinery rotors, its cross sectional~~  
~~illustration along A A' is the same as Fig. 2;~~
- (2) Axial pre-stressed ~~spring~~ spring-springs SP100 may be installed  
15 ~~between on axially opposite outside sides of the two~~  
electric machinery rotors R100 ~~and on the outside, with~~,  
one of them ~~the~~ generating a reverse torque in the direction  
of rotation increases, the two individual electric  
machinery rotors R100 ~~exhibits~~ exhibiting mutually  
20 opposite axial ~~mutual separating modulation displacement,~~  
as shown in Fig. 8, ~~as shown in Fig. 8 is the cross sectional~~  
~~illustration of the realization of this invention where~~  
~~the pre stressed springs are installed on the outside~~  
~~of the two electric machinery rotors, its cross sectional~~  
25 ~~illustration along A A' is the same as Fig. 2;~~

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(3) Axial pre-stressed spring SP100 may be installed between  
the two electric machinery rotors R100 and also on the  
axially opposite outer sides, with the positive or reverse  
torque in the direction of rotation increases, the two  
5 individual electric machinery rotors R100 exhibit  
exhibiting complementary or opposite axial mutual  
compelling or mutual separating modulation displacement,  
as shown in Fig. 9, ~~as shown in Fig. 9 is the cross sectional~~  
~~illustration of realization of this invention where the~~  
10 ~~pre-stressed spring is installed between the two electric~~  
~~machinery rotors and on the outsides, its cross sectional~~  
~~illustration along A A' is the same as Fig. 2.~~

Similarly, Fig. 5 is ~~the realization example of this~~  
~~invention where~~ shows an embodiment including two electric  
15 machinery rotors with individual transmission structures, or  
~~as shown in while Fig. 6 is the realization example of this~~  
~~invention where in this application between~~ shows an embodiment  
in which the individual transmission shafts are installed with  
controllable clutches, ~~the~~ The principle of installation for  
20 the pre-stressed spring-spring(s) is the same for each  
embodiment.

As shown in Fig. 10, ~~is the cross sectional illustration~~  
~~of the realization example of this invention where the two~~  
electric machinery rotors ~~each has its~~ may each have their own  
25 transmission shaft and with the pre-stressed springs installed  
~~between the two electric motors there are installed pre-stressed~~

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~~springs, its cross sectional illustration along A A' is the same as Fig. 2.~~

As shown in Fig. 11, ~~is the cross sectional illustration of the realization example of this invention where the two~~  
5 electric machinery rotors may again each has its have their  
own transmission shaft and a pre-stressed spring may be  
installed between the two electric machinery rotors and the  
outer stator ~~there is installed pre stressed spring, its cross~~  
~~sectional illustration along A A' is the same as Fig. 2.~~

10 As shown in Fig. 12, ~~is the cross sectional illustration of the realization example of this invention where the two~~  
electric machinery rotors may each has its have their own  
transmission shaft and pre-stressed springs may installed  
between the two electric machinery rotors and between the two  
15 electric machinery rotors and the outer stator ~~there is~~  
~~installed pre stressed spring, its cross sectional~~  
~~illustration along A A' is the same as Fig. 2.~~

As shown in Fig. 13, ~~is the cross sectional illustration of the realization example of this invention where~~  
20 controllable  
clutches may be installed between the individual transmission  
~~shaft shafts~~ of the two electric machinery rotors ~~there are~~  
~~installed controllable clutches and~~ pre-stressed springs may  
be installed between the two electric machinery rotors ~~there~~  
~~are installed pre stressed springs, its cross sectional~~  
25 ~~illustration along A A' is the same as Fig. 2.~~

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As shown in Fig. 14, ~~is the cross sectional illustration~~  
~~of the realization example of this invention where~~ controllable  
clutches may be installed between the individual transmission  
shaft-shafts of the two electric machinery rotors ~~there are~~  
5 ~~installed controllable clutches and~~ pre-stressed springs may  
be installed between the two electric machinery rotors and the  
outer stator ~~there are installed pre-stressed springs, its cross~~  
~~sectional illustration along A-A' is the same as Fig. 2.~~

As shown in Fig. 15, ~~is the cross sectional illustration~~  
10 ~~of the realization example of this invention where~~ controllable  
clutches may be installed between the individual transmission  
shaft-shafts of the two electric machinery rotors ~~there are~~  
~~installed controllable clutches and~~ pre-stressed springs may  
be installed between the two electric machinery rotors and  
15 between the two electric machinery rotors and the outer stator  
~~there are installed pre-stressed springs, its cross sectional~~  
~~illustration along A-A' is the same as Fig. 2.~~

The above stated dual electric machinery ~~rotors-rotor~~  
structures can be installed ~~with human in manual, or mechanical~~  
20 mechanically driven, or fluid hydraulic, or electrical  
electrically driven relevant device-devices so as to perform  
reversal driving ~~to of~~ the transmission shaft, and further to  
modulate and set the relative position of the electric machinery  
rotor and electric machinery magnetic field, so as to actively  
25 modulate electric machinery characteristics. ~~and depending on~~  
~~the need to install the~~ The rotor structures can further

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selectively include a relative displacement limitation device  
or fixed positioning locking device between the electric  
machinery rotor and the transmission shaft, ~~or can be installed~~  
~~with human, or mechanical, or fluid, or electrical driven~~  
5 ~~relevant device for the pre-stressed modulation and setting~~  
~~mechanism of the axial pre-stressed spring, to actively modulate~~  
~~and setting the axial pre-stress of the pre-stressed spring~~  
~~towards the electric machinery rotor, to modulate and preset~~  
~~the position relationship between the electric machinery rotor~~  
10 ~~and electric machinery magnetic field, further to modulate the~~  
~~electric machinery characteristics or pull selected control~~  
~~mechanism or testing device.~~

The in the above stated described electric machinery with  
dual electric machinery rotors, and each the individual electric  
15 machinery magnetic field structure, include structures may both  
are be generators or both are motors, or one is one may be a  
generator and the other is a motor structures structure.

~~This rotor axial activation modulation of electric~~  
~~machinery due to reverse torque its electromagnetic effect~~  
20 ~~structural aspect of electric machinery rotor R100 and electric~~  
~~machinery magnetic field F100 include~~ The axial stack height  
of the magnetic core of the rotor R100 may have the following  
relationships to the magnetic field or pole structure:

(1) The axial stack height of the magnetic core of the electric  
25 machinery rotor is greater than that of the electric  
machinery magnetic field structure;

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(2) The axial stack height of the magnetic core of the electric machinery rotor is equal to that of the electro-magnetic field structure;

(3) The axial stack height of the magnetic core of the electric machinery rotor is less than that of the electro-magnetic field structure.

~~This~~ ~~The rotor axial activation modulation of electric machinery due to reverse torque, its modulation model of generator or motor characteristics by producing~~ and the resulting axial displacement between its the electric machinery rotor and electric machinery magnetic field, includes can be varied by means of controllable voltage, current, frequency, etc. inputs versus output linear characteristics of the electric generator, and controllable motor speed, torque, synchronous or asynchronous, etc. input versus output linear characteristics, or by a pulling axial control clutch CLS100 or pulling other selected control mechanism or testing device, as follows, this rotor axial activation modulation of electric machinery due to reverse torque, its reverse torque structure for rotor axial activation modulation of electric machinery includes:

(1) When the axial stack height of the magnetic core of the electric machinery rotor is greater than that of the electric machinery magnetic field structure, the modulation method of the electric machinery ~~function is to make of the invention use of~~ modulates the relationship

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between the magnetic poles of the electric machinery rotor  
and the electric machinery magnetic field ~~in~~ as a result  
of the axial ~~corresponding~~ axial displacement generated  
by ~~using the~~ centrifugal force, so as to couple the electric  
5 magnetic machinery rotor with fixed characteristics ~~with~~  
by means of a different magnetic flux density or different  
gap, or by means of different magnetic ~~or different exciting~~  
properties or excitation method, or by means of any other  
different structure ~~of~~ resulting in a different electric  
10 machinery physical property ~~or electric machinery magnetic~~  
~~field structure of different electric machinery~~  
~~characteristics~~, so as to generate the needed operation  
and output characteristics of the generator or motor or  
to pull the a selected control mechanism or testing device;

15 (2) When the axial stack height of the magnetic core of the  
electric machinery rotor is greater than that of the  
electro-magnetic field, the modulation method ~~of the~~  
~~electric machinery function is to make~~ makes use of the  
magnetic poles of the electric machinery rotor and the  
20 magnetic poles of the electro-magnetic field to generate  
axial pulling displacement by using the reverse torque,  
~~and the~~ The electric machinery rotor coupled by the electric  
machinery magnetic field can be an axial multiple-section  
circuit squirrel-cage rotor structure, and each section  
25 of squirrel-cage rotor structure ~~with~~ can have different  
electric machinery characteristics, as shown in Fig. 16,

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~~is the realization example of this invention in the~~  
~~squirrel cage rotor structure with multiple circuit, in~~  
~~which the cross sectional illustration along A-A' is the~~  
~~same as in Fig. 2; or can be rotors excited by windings;~~  
5 ~~or rotors consist~~ consisting of permanent magnetic type,  
~~or salient type, or hysteresis type, or eddy current type~~  
~~rotor structures, which has~~ having an outer diameter that  
varies in an axial direction, or an armature of a commutator  
type electric machinery rotor, arranged to match the axial  
10 activation modulation displacement and with specific  
axially extended commutator CM100, so as to increase the  
coupling range with electric brush BU100, as shown in  
Fig. 17. ~~is the realization example of this invention in~~  
~~armature with axially extended commutator, in which the~~  
15 ~~cross sectional illustration along A-A' is the same as~~  
~~in Fig. 2; By re-arranging the various alternating current~~  
or direct current and brush or brushless electric machinery  
rotor, specifically with different outer diameter  
diameters, or different number numbers of poles, ~~or~~  
20 different ~~method~~ methods of excitation, or electric  
~~machinery rotor consists of different electric machinery~~  
rotor characteristics or different electric structures,  
~~in order to produce the a~~ a desired operation and  
characteristics of a generator or motor and the  
25 transmission characteristics or pulling of a selected  
control mechanism or testing device can be achieved;

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- (3) ~~By installing the~~ The previously described, in (1) and  
(2) above, ~~of~~ electric machinery magnetic field structure  
and electric machinery rotor with different physical  
characteristics and different electric machinery  
5 structure, ~~to produce~~ produces the selected generator or  
motor operation characteristics by using reverse torque  
for axial activation modulation of electric machinery,  
~~or to pull axial control clutch CLS100, or to pull other~~  
another selected control mechanism or testing device. ~~As,~~  
10 as shown in Fig. 18 ~~is the realization example of this~~  
~~invention in using reverse torque for axial activation~~  
~~modulation to pull axial control clutch, in which the cross~~  
~~sectional illustration along A-A' is the same as in Fig.~~  
~~2;~~
- 15 (4) ~~By installing the~~ The previously described, in (1) and  
(2) above, ~~of~~ electric machinery magnetic field and  
electric machinery rotor with different physical  
characteristics and different electric machinery  
structure, ~~and combining the relevant mechanism of~~ may  
20 be combined with a controllable electric machinery rotor  
to perform axial displacement and position setting, by  
externally using ~~human manual~~, ~~or~~ mechanical, ~~or~~ fluid,  
or electromagnetic effect driving, so as to modulate the  
relative electric machinery relative coupling position  
25 between the electric machinery rotor and the electric  
machinery magnetic field, and further to modulate the

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electric machinery operation characteristics<sub>7</sub>, as shown  
in Fig. 19 ~~is the realization example of this invention~~  
~~in the electric machinery magnetic field or electric~~  
~~machinery rotor for axial modulation setting, in which~~  
5 ~~the cross sectional illustration along A A' is the same~~  
~~as in Fig. 2<sub>7</sub>. its characteristics is to make~~ The electric  
machinery of this embodiment makes use of one side of the  
rotating electric machinery stator for the installation  
of an internal circular helical structure axial modulation  
10 seat AB100, for coupling to circular pulling block AN100,  
~~whereas the outer side of the circular pulling block AN100~~  
~~are being~~ installed with a helical structure<sub>7</sub> for the  
coupling to the inner circular helical structure of axial  
modulation seat AB100 ~~inner circular helical structure,~~  
15 the threads of both helical structures ~~are being~~ of  
irreversible transmission type<sub>7</sub>. ~~circular~~ Circular  
pulling weight AN100 ~~is for~~ enables the circular weight  
block L100 and fixed screw BL100 to be fixed to the stepping  
section where the rotating shaft outer perimeter is smaller,  
20 so that when the circular pulling weight AN100 is rotated  
by the hand wheel HD100 or pulled by some other human or  
mechanical or fluid or magnetic structure, it can perform  
axial single or double directional pulling of transmission  
shaft S100, so as to change the relative coupling positions  
25 between the electric machinery rotor connected to the  
transmission shaft S100 and the electric machinery magnetic

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field, and further to modulate the electric machinery characteristics, ~~between the~~ The circular pulling weight AN100 and transmission shaft S100 can be ~~rotary~~ relative rotating relatively rotatable, and depending on  
5 the need, there can be installed a bearing or lubricant sleeve structure.

The axial modulation preset structure example ~~stated in~~ of Fig. 19 above, due to its many structures with similar functions, ~~the realization example shown in Fig. 19 is just~~  
10 ~~one of them~~ can be modified in many ways, and is not used to limit the applications, ~~other~~ Other structures with the same functions can be derived from commonly known related functional structures.

~~This~~ The axial rotor axial activation modulation of  
15 electric machinery due to reverse torque, its mechanical relative displacement ~~driving~~ varying a relationship between the electric machinery rotor and electric machinery magnetic field structure, includes may make use of:

- (1) External electric machinery rotor ~~rotary electric~~  
20 ~~machinery structure~~ structures;
- (2) Internal electric machinery rotor ~~rotary electric~~  
~~machinery structure~~ structures;
- (3) Dual moving type structures in which the magnetic field structure and electric machinery rotor both are rotary;
- 25 (4) Linear electric driving.

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~~This rotor axial activation modulation of electric machinery due to reverse torque, its structure includes~~ In addition, the electric machinery structure of the invention may include:

- 5 (1) Cylindrical rotating electric machinery ~~structure~~ structures;
- (2) ~~Taper Tapered~~ rotating electric machinery ~~structure~~ structures;
- (3) Linear electric machinery ~~structure~~ structures.

10 To sum up, ~~this rotor axial~~ the invention provides axial rotor activation modulation of electric machinery due to reverse torque ~~is to reveal,~~ between the transmission shaft of the electric machinery and the electric machinery rotor or between the transmission shaft of the electric machinery and the  
15 transmission element driven, ~~there is installed the~~ as a result of a reversible activation helical structure consist of including a helical propeller structure or a helical propeller structure with a ball bearing or roller bearing and an axial pre-stressed spring, so that during the operation of the  
20 electric machinery, by use of the reverse torque and driving direction between the electric machinery rotor and the loading, ~~to modulate the electric machinery rotor~~ is caused to perform axial displacement, and further to thereby modulate the electric machinery characteristics between the electric machinery and  
25 electric machinery magnetic field structure, ~~or pulling axial control clutch CLS100, or pulling other another selected control~~

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mechanism or testing device, ~~the~~. The functions are precise  
and the ideas are innovative, ~~and the applicant has searched~~  
~~through previous skills and found nothing whatsoever has been~~  
~~revealed, hence requests to grant approval by law.~~

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ABSTRACT

~~This case is about between the transmission rotating shaft of the electric machinery and the electric machinery rotor or between the transmission rotating shaft of the electric machinery rotor and the transmission element driven, there is installed reversible activation helical structure consist of helical nut structure or ball bearing or roller bearing helical nut structure and there is installed axial pre-stressed spring, and depending on the magnitude of the reverse torque between the electric machinery rotor and the loading and the driven direction status, to control the electric machinery rotor to perform axial displacement, and further to modulate the electric machinery characteristics between the electric machinery rotor and the electric machinery magnetic field or to pull the selected control mechanism or testing device. The invention involves installation of a helical nut structure, or a helical nut and ball or roller bearing structure, between an electric machinery transmission shaft and a driven transmission element. Depending on the torque between the electric machinery rotor, and on the loading or driving direction, the corresponding axial displacement of the electric machinery rotor can be controlled, and further the electric machinery characteristics relative to the electric machinery rotor and the electro-magnetic field can be modulated to achieve a desired control structure or testing device.~~

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